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L7	L6 and l5	90	L7
L6	internet or online or www or world near4 web or website or web near4 (site or server or browser or page)	40713	L6
L5	L4 and l3	206	L5
L4	buyer or purchaser or customer or consumer	155704	L4
L3	L2 and l1	272	L3
L2	balance	246570	L2
L1	(prepaid or pre adj2 paid or prepay\$ or pre adj2 pay\$) near7 account	409	L1

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L9: Entry 20 of 55

File: USPT

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DOCUMENT-IDENTIFIER: US 6188752 B1

TITLE: Method and apparatus for providing prepaid telecommunications services

DATE FILED (1):

19961112Abstract Text (1):

Instead of requiring a customer to carry around one or more prepaid telephone calling cards (such cards are effectively functioning as limited, fixed amounts of money), a communications network-based solution is provided that facilitates both prepayment and use of prepay telecommunications services. A subscriber is assigned a record in a network database. The database record includes an account number and an associated prepaid monetary value. Then when the subscriber calls from a prepaid telecommunications terminal (e.g., a public telephone), requesting a telecommunications service (e.g., a long distance telephone call), the communications network processes the request by analyzing the subscriber database record. If the prepaid monetary value in the subscriber's record is sufficient for the requested service, the service is authorized. The prepaid monetary value in the subscriber's record is decreased in accordance with the service rendered. Accordingly, a subscriber does not need to purchase any prepaid calling card, remember to carry the prepaid calling card, or remember the amount stored on the calling card. Rather, prepaid calling services are obtained simply by subscribing to the network prepayment service. The subscriber also easily adds monetary value to the subscriber's prepaid account by accessing the prepaid network service, (e.g., by dialing the appropriate network service number), indicating the desire to add monetary value to the subscriber's prepaid account in the database. The subscriber is prompted to enter a desired amount of money which is then added to the prepaid monetary value field in the subscriber's database record. There is no need to travel to a card distribution center or the like to obtain a new or recharged prepaid calling card.

Brief Summary Text (4):

Prepaid telephone calling cards are known. Cards are batch activated by the card provider in a limited number of predetermined values. Such cards are purchased from vending machines, point of sale terminals, or other distribution centers, in fixed value increments, such as \$10, \$20, etc. A \$10 card, for example, provides the cardholder with \$10 worth of telephone time to make telephone calls. If during the call, the time remaining on the card is about to expire, the customer may be prompted that only a certain amount of time remains. When the designated time has expired, the call is automatically terminated. Because charges are limited to the card's face value, neither the customer nor anyone who obtains possession of the card can run up a large bill.

Brief Summary Text (5):

These types of prepaid calling cards have been successful because prepaid calling card customers avoid collect and operator assistance surcharges, and they can obtain local and long distance calling without credit and without payment of monthly bills. Further, no coins are necessary to place a call. Another bonus is that the operator does not have to collect coins from public telephones which also reduces vandalism and theft. However, these prepaid cards have significant drawbacks. Such calling cards are inconvenient because the customer must physically carry the card on his/her person. If the card is forgotten, the customer is further inconvenienced when a call needs to be made. In addition, the prepaid calling cards issued with fixed/preset amounts do not necessarily correspond with the amount of telephone time a user needs or ends up

using. If the allotted amount is too little, the customer's call is prematurely terminated. The only solution is for the customer is the further inconvenience of carrying multiple cards that also may be stolen or lost. Moreover, if a caller uses less than the allotted amount on the card, the remaining amount may be essentially useless if (1) it is less than the basic amount required to make a particular call or (2) it is so little that the call will be for too short a period of time. Another serious problem is that even the process of obtaining a new card is cumbersome and time consuming because the customer is required to physically travel to a sales office or other distributor where these cards are issued or recharged. Still further are the environmental drawbacks associated with disposing of all the used prepaid calling cards.

Brief Summary Text (11):

It is a further object of the present invention to eliminate the need for a customer to have to obtain a new or renewed card for continued use of prepay services.

Brief Summary Text (12):

To meet these and other objectives, the present invention takes a completely different approach to providing prepaid telecommunications services. Instead of requiring a customer to carry around one or more cards where the cards are effectively functioning as limited, fixed amounts of money, the present invention provides a network-based solution that facilitates both prepayment and use of telecommunications services. A subscriber is assigned a record in a database. The database record includes an account number and an associated prepaid monetary value. When the subscriber calls from a prepaid telecommunications terminal (e.g., a public telephone), requesting a telecommunications service (e.g., a long distance telephone call), the communications network processes the request by analyzing the subscriber's database record. If the prepaid monetary value in the subscriber's record is sufficient for the requested service, the service is authorized. The prepaid monetary value in the subscriber's record is decreased in accordance with the service rendered. Accordingly, a subscriber does not need to purchase any prepaid calling card, remember to carry the prepaid calling card, or remember the amount stored on the calling card. Rather, prepaid calling services are obtained simply by subscribing to the network prepayment service.

Brief Summary Text (13):

In accordance with the present invention, a subscriber may easily add monetary value to the subscriber's prepaid account. The user simply accesses the prepaid network service (e.g., by dialing the appropriate network service number), and indicates the desire to add monetary value to the subscriber's prepaid account in the database. Once the account and/or caller is/are identified and preferably authenticated, the subscriber is prompted to enter a desired amount of money to be added to the prepaid monetary value field in the subscriber's database record. The amount to be added may be fixed or variably determined by the subscriber. A fixed amount may make prepayment particularly easy since the subscriber could simply call the service and the fact of making the call would add a fixed amount to his prepaid account. The network therefore generates a new prepaid monetary value in the database associated with the prepaid account number. Immediately thereafter, the user can request and receive prepaid telecommunications services without a card and without concern whether a prepaid calling card has sufficient remaining funds to pay for the desired telecommunications service.

Brief Summary Text (14):

Another significant feature of the present invention is that the communications network takes care of generating a billing record for the subscriber which includes the amount of money added to the prepaid monetary value of the database. At the end of a billing cycle when the subscriber receives his regular telephone bill, an entry is included corresponding to the prepaid monetary value added to the subscriber's prepaid account number.

Brief Summary Text (15):

While the present invention may be implemented in a number of different ways, a preferred example embodiment employs an intelligent network. An intelligent network node connected to the communications network provides the prepayment telecommunications service. The intelligent network node includes a service control

processor that stores database records assigned to network prepayment service subscribers. Each database record includes a prepaid account number and an associated prepaid monetary value for each network subscriber. A service switching processor, coupled to either directly to the subscriber or to the subscriber's local switch and then to the service control processor, detects and routes calls directed to prepayment of communications services involving network subscribers to the service control processor. The service control processor makes necessary prepayment decisions, e.g., whether the caller has a prepay account, whether the account have sufficient current funds, whether the caller is authorized to alter the account amount, etc. The service control and/or switching processors also coordinate commands to the network, e.g., authorizing a prepaid call, updating billing records, etc.

Brief Summary Text (16):

The intelligent node interfaces with the subscriber over the network using any number of techniques including speech synthesis, speech recognition, DTMF tones, etc. to permit the subscriber to add to the prepaid monetary value associated with the subscriber in the database an amount of money entered by the caller, or alternatively, add a fixed amount per each service call. The newly generated prepaid monetary value in the database associated with a subscriber's prepaid account number can be immediately used to pay for a subsequent prepayment communications service.

Brief Summary Text (17):

Accordingly, the present invention provides a number of advantages to both the telecommunications subscriber and the telecommunications operator. For the telecommunications subscriber, there is no need to buy or renew one or more prepaid calling cards once the call value of an existing card is expired. Therefore, there is no need for the subscriber to travel to a telecommunications sales outlet or other distributor of prepaid calling cards. Significantly, the need for even carrying a card is eliminated. Of course, if desired, a single card having a prepayment network service's telephone number and/or the subscriber's prepaid account number may be issued until such numbers are memorized. Also the subscriber does not need to have cash handy to buy new prepaid calling cards since the prepayment amount requested via telephone is included on the subscriber's monthly telephone bill.

Detailed Description Text (3):

Referring to FIG. 1, a simplified telecommunications system 10 is shown in which a non-limiting, preferred example embodiment for implementing the present invention is described. A simplified telecommunications network 12 includes a plurality of optional local telephone exchanges 16a-16e (alternatively, subscribers can use the intelligent service switching processor as their local exchange), intelligent network nodes 18, billing system 40, and a plurality of telecommunications devices 14a-14f. Since wireline telecommunications devices including public pay telephones 14a, subscriber telephones at the subscriber's home or residence 14d, portable personal computers (laptops), personal digital assistants and the like 14c, and personal computers and facsimile machines 14e, and wireless telecommunications devices such as cellular radio telephones 14b can all be connected or otherwise coupled to the communications network 12 (either directly or indirectly, e.g., via the internet 11), the term "telecommunications device" or "communications device" includes all such devices. Likewise, the term "communications service or services" includes any communications service that is provided by the telecommunications network 12 including but not limited to communication processes (both voice and data) conducted between two or more telecommunications devices that involve a telecommunications network. While prepaid telecommunications services are most commonly viewed today in the context of public pay telephones, the present invention is applicable to any communications service for which payment must be rendered before, during, or immediately after the telecommunications service is provided. Moreover, while the present invention is sometimes described in the specification in the context of an intelligent network (IN) implementation, the present invention is in no way limited to an IN implementation or apparatus.

Detailed Description Text (12):

Another prepay communications service relates to a subscriber automatically adding monetary value to his prepay account using, for example, his residence telephone 14d or personal computer 14e linked for example to the communications network via the internet 11. Of course, call connections may be set up through other nodes, exchanges,

and networks in addition to the communications network 12 including for example the packet-switched data network, radio telephone networks, etc. In addition, billing information generated as a result of the prepayment network service is provided to a billing system 40 which includes its own computer 42 and database 44. Billing system database 44 contains records for subscribers to the network.

Detailed Description Text (13):

FIG. 2 illustrates a representative database record 50 stored in service control point database 26 for use in implementing the prepayment network service in accordance with this example embodiment of the present invention. Database record 50 includes a subscriber account number field 52, a prepaid account number field 54, an optional personal identification number (PIN) or other security code field 56, and a current prepayment monetary amount field 58.

Detailed Description Text (15):

The prepaid account number is a number which specifically identifies the subscriber's subscription to the prepayment network service. Of course, those in the art will appreciate that only one or both of the subscriber and prepay account numbers may be used in database record 50 depending on how the prepayment network service is to be accessed and implemented. Preferably, there is some sort of authentication or other security procedure along with identification of the subscriber and/or prepay account number(s). To this end, requiring the caller to enter an additional security code such as a PIN increases the security and integrity of the prepay network service.

Detailed Description Text (17):

FIG. 3 is an example data billing record created by the service control point 22 and forwarded to the billing system computer 42. The originating telephone number 72 is the telephone number associated with the telecommunications device originating the call. The destination telephone number 74 is the telephone number associated with a recognized destination in the communications network such as the special prepay network service number in intelligent network nodes 18 or another telecommunications device 14f outside of the communications network 12. The subscriber and prepay account numbers are included in one or more fields 76. For calls which are made to other telecommunications devices, start time 78 and lapsed time 80 of the call may be useful information to be included on the billing report. Geographic information such as the call origination location 82, and if relevant, the call destination location 84 may also be included. The other billing information field 86 may be included in the message as needed or otherwise desired. Such a billing record is sent to billing system 40 from the service switching point 28 by way for example of a dedicated link and is then processed by the billing system computer 42. The received billing record is correlated with the subscriber billing information already logged in its database 44 in order to generate an appropriate billing statement to the subscriber to include a description of prepayment network services rendered during that billing cycle and the charges therefor.

Detailed Description Text (19):

Initially, a decision is made at the network whether a subscriber is requesting a prepaid telecommunications service (block 83). One example way in which such a service might be requested would be the dialing of a prepay network service telephone number. Another example might be for a caller to simply request a prepayment service from a prepayment telecommunications device which prompts the caller to input payment. In response to the prompt, the caller enters an appropriate account number (either a subscriber account number or prepay account number) which is detected by the network. If a prepay network service is requested, the network requests entry of a prepay calling account number or receives some other input which permits identification of the appropriate account number and authenticates or otherwise authorizes the request (block 85). For example, the network may require the caller to enter a security code or personal identification number (PIN) in order to make sure the service request is legitimate and authorized. In one particular instance, if the caller is calling from the subscriber telecommunications device (e.g., a residence or business telephone), the network is already aware of the subscriber account number. If the request is somehow invalid or not authorized as determined in block 87, the network sends an appropriate message (block 92) back to the caller.

Detailed Description Text (22):

Returning to decision block 99, if the prepay network communications service request is to add to the subscriber's existing prepayment amount in a subscriber's database record, the network prompts the subscriber for the monetary amount to be added (block 100). Such a prompt could be a for example synthesized voice prompt. The subscriber then inputs a desired amount either by depressing corresponding keys on the telecommunications device or by a voice input that is detected and decoded by appropriate voice recognition software in the network. The subscriber's database record is then updated by adding the input amount to generate a new prepaid monetary amount. The network confirms that amount using for example a synthetic voice message as well as informs the subscriber of the current prepaid balance (block 102). An appropriate billing record or other similar message is generated by the network to include the newly added prepay value to the subscriber's regular telephone bill under a line item such as "Prepay Services" (block 98).

Detailed Description Text (23):

FIG. 4(b) shows a flowchart of a more streamlined approach to adding pre-pay value to a subscriber account when a call is placed from the subscriber's residence or business telephone or other device associated with the subscriber's account number. Initially, a decision is made whether the subscriber has dialed the pre-pay calling service number, e.g., an "800" number for accessing the pre-pay calling service (block 110). The call from the subscriber's residence or business telephone to the pre-pay calling service number is interpreted as a request to add monetary value to that subscriber's pre-pay account. The request is checked for validity and authorization (block 112). If the request is invalid or not authorized as determined in block 87, the network sends an appropriate message (block 114) back to the caller. Assuming that the prepay network service request is valid and authorized, a preset amount of money, e.g., \$10, is automatically added to the subscriber's account in the database (block 116). The amount automatically added to the subscriber's pre-pay account is confirmed to the caller, e.g., via voice synthesized message, along with the subscriber's current pre-pay account balance (block 118). An appropriate billing record such as that shown in FIG. 3 is generated and forwarded to the billing computer (block 120) and correlated in the billing system subscriber database for use in generating the subscriber's monthly bill.

Detailed Description Text (24):

An illustration of how a subscriber increases his prepaid account balance using the example intelligent network node implementation in FIG. 1 is now described in conjunction with FIG. 5. In step 1, the subscriber dials from a subscriber terminal a prepay network service number. The local exchange routes the call to the service switching point 28 which registers this as an intelligent network call by detecting these dialed digits. The triggering function 31 is also used to collect necessary call data which is then forwarded to the service control point 20 as indicated in step 2. The service logic 24 in service control point 20 is used by computer 22 to analyze the information from the service switching point 28 in step 3.

Detailed Description Text (25):

More particularly, the service control processor detects the subscriber account number associated with this subscriber terminal, retrieves the subscriber's database record from database 26, checks the current prepaid balance in the database record, and preferably performs some type of authentication. In this example, the service control processor 20 sends a message to the service switching point 28 instructing it to prompt the subscriber terminal for entry of a security code such as a PIN (step 4). The switching service intelligent peripheral 34 transmits via switching function 32 a corresponding synthesized voice prompt such as "ENTER PIN" in step 5. The subscriber then enters his PIN number (step 6) which is passed via switching function 32 to the intelligent peripheral 34 which transforms the tones into data (step 7). This data is then forwarded to the service control point 20. The service control point 28 checks the entered PIN number, and if it does not match the PIN stored in the subscriber database record, either requests re-entry of the PIN or aborts the transaction (step 8).

Detailed Description Text (26):

Assuming that the subscriber properly enters his PIN code, the service control point 20 instructs the service switching point 28 to prompt the subscriber telecommunications device 14d for a monetary value to be added to his prepaid account.

Again, the intelligent peripheral 34 generates a voice prompt communicated to the subscriber terminal via switch function 32 such as "ENTER DOLLAR VALUE TO BE ADDED TO YOUR PREPAID CALLING ACCOUNT." Then in step 11, the subscriber enters the dollar amount (e.g., using numbers entered by DTMF keypad), which is detected by the intelligent peripheral 34 via switching function 32, converts the DTMF tones into appropriate digital format, and forwards the amount to the service control point 20.

Detailed Description Text (27):

The service control point 20 updates the subscriber record stored in database 26 (step 13). The service control point 20 then signals the billing system to update the subscriber's account in the billing system database 44 to reflect the amount added by the subscriber during this transaction and any associated service (step 14). The service switching point 28 is also instructed to confirm the transaction with the subscriber terminal. In response, the intelligent peripheral 34 generates a voice message routed to the subscriber terminal via switching function 32 to the effect "YOUR PREPAID CALLING ACCOUNT HAS BEEN INCREASED BY (the amount the subscriber entered). YOUR NEW PREPAID ACCOUNT BALANCE IS (the total amount)" (step 15).

Detailed Description Text (28):

As described earlier, the present invention provides a number of advantages to the subscriber. Significantly, the subscriber does not need to continually purchase prepaid calling cards. This task is quite time consuming in that the subscriber must travel to a telecommunications sales outlet or other distributor. Instead, prepay services are only a telephone call away. For the operator, the invention not only reduces costs in terms of the overhead associated with generating and administering this card creation and distribution, but also reduces costs associated with the manufacture, installation, and maintenance of card readers at prepaid telecommunications devices. In addition, by providing an extremely convenient way for a subscriber to add money to his prepaid services account ultimately results in higher network usage and therefore more network operator revenue.

CLAIMS:

1. In a telecommunications network, a method for facilitating prepayment for communication services, comprising the steps of:

providing a subscriber to an automated, prepayment telecommunications network service with a prepaid account number having associated therewith a prepaid monetary value;

using the prepaid account number at a communications terminal coupled to the communications network to pay for a communications service requested from the communications network, the prepaid monetary value being decreased in accordance with the communications service rendered by the communications network;

the subscriber calling a prepayment telecommunications network service number from a communications terminal requesting that a specified monetary value be added to the prepaid account number;

the prepayment telecommunications network service determining the prepaid account number associated with the request;

the prepayment telecommunication network service authenticating the prepaid account number and confirming that the caller making the request is authorized to add monetary value to the prepaid account number; and

based on the authentication and confirmation, the prepayment telecommunications network service automatically adding the specified monetary value to the prepaid monetary value associated with the prepaid account number and providing charges corresponding to the added monetary value to a communications network billing system so those charges are included in a telephone bill to the subscriber,

wherein the subscriber may thereafter use the added monetary value to pay for a subsequent communications service.

4. The method in claim 1, wherein the confirming step includes:

requesting entry of an authentication number;

checking an entered authentication number; and

if the entered authentication number is valid, proceeding with adding the specified monetary value associated with the prepaid account number.

6. The method in claim 5, further comprising:

the subscriber entering the prepaid account number at the communications terminal, and

the prepayment telecommunications network service determining if the monetary value associated with prepaid account number is sufficient to pay for the telecommunications service.

7. The method in claim 5, further comprising:

issuing the subscriber a card having card information including the prepaid account number, wherein the card information is input at the communications terminal and the prepayment telecommunications network service determines if the monetary value associated with prepaid account number is sufficient to pay for the communications service being requested.

8. A method of operating a communications network where communication services provided by the system may be paid for in advance using a prepayment service, comprising:

creating a record in a database assigned to a network subscriber, the database record including a prepaid account number, a subscriber number, and an associated prepaid monetary value;

the subscriber requesting a communications service from a prepay communications terminal;

the prepayment service processing the request and checking if the prepaid monetary value in the subscriber's record is sufficient for authorizing the requested service, and if so, authorizing the requested service;

the prepayment service decreasing the prepaid monetary value in the subscriber's record in accordance with the service rendered;

the subscriber dialing a telephone number to place a call to the prepayment service and requesting addition of monetary value to the subscriber's prepaid account;

in response to the subscriber request to add monetary value to the subscriber's prepaid account number in the database, the prepayment service:

authenticating the subscriber;

prompting the subscriber to enter an amount of money to be added to the prepaid monetary value in the database;

adding to the prepaid monetary value in the database an amount of money forwarded by the subscriber during the call to generate a new prepaid monetary value in the database associated with the prepaid account number; and

communicating the amount of money added to the prepaid monetary value to a billing controller to add the amount of money to a telephone bill issued to the subscriber.

10. The method in claim 8, further comprising:

the prepayment service authorizing a subsequent prepayment communication service associated with the prepaid account number based on the new prepaid monetary value.

11. The method in claim 8, further comprising:

the subscriber initiating a communication service from a telecommunications device coupled to the network and indicating that the communication service will be paid for using the prepaid account number;

the prepayment service prompting input of the prepaid account number;

the subscriber inputting the prepaid account number; and

the subscriber authorizing the communications service if the prepaid monetary value associated with the input prepaid account number stored in the database is sufficient to cover at least part of the communications service.

15. The method in claim 8, wherein the database record includes a security number, the method further comprising:

prompting entry of the security number after confirming the subscriber number;

checking an entered security number; and

if the entered security number is valid, proceeding with adding the prepaid monetary value associated with the prepaid account number.

16. In a communications system including a plurality of communication terminals having access to a communications network, at least one of the communications terminals being a prepay terminal requiring payment before a desired communications service is rendered, an Intelligent Network (IN) apparatus providing a prepayment telecommunications service comprising:

a service control point storing records in a database assigned to IN subscribers, each database record including a prepaid account number and an associated prepaid monetary value for each IN subscriber, and

a service switching point, coupled to the service control point, detects and routes calls directed to prepayment of communications services involving IN subscribers to the service control point;

wherein when the service switching point detects a subscriber calling a prepayment telecommunications service number requesting that a specified monetary value be added to the subscriber's prepaid account and signals the service control point, the service control point interfaces with the subscriber through the service switching point to permit the subscriber to add to the prepaid monetary value associated with the subscriber in the database an amount of money entered by the subscriber to generate a new prepaid monetary value in the database associated with the prepaid account number such that a subsequent prepayment communication service may be requested and rendered using the new prepaid monetary value, and

wherein the service control point communicates the amount of money added to the prepaid monetary value to a billing processor to add the amount of money to a telephone bill issued to the subscriber.